

ABSTRACT OF THE DISCLOSURE

An illumination optical system is disclosed, which provides a luminous flux with a small incident angle on an illumination surface in one axis direction on a section of the luminous flux. The illumination optical system can suppress a reduction in light amount by a mask provided for a polarization conversion element. The illumination optical system has a light source and an optical integrator. The optical integrator uses a lens array to perform splitting of a luminous flux from the light source. The illumination optical system has the polarization conversion element including a polarization beam splitter array, a plurality of $1/2$ wave plates, and a mask. The light source is a discharge gas exciting arc tube of a DC drive type.